

# **APPENDIX C**

## **HAZARDOUS MATERIALS MANAGEMENT PLAN**

### **INTRODUCTION**

This Hazardous Materials Management Plan is provided pursuant to Bureau of Land Management (BLM) Instruction Memoranda Numbers WO-93-344 and WY-94-059, which require that all National Environmental Policy Act (NEPA) documents list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported or disposed of as a result of a proposed project. Hazardous materials, as defined herein, are those substances listed in the Environmental Protection Agency's (EPA's) *List of Hazardous Substances* (40 Code of Federal Regulations [CFR] Part 302) and extremely hazardous materials are those identified in the EPA's *List of Extremely Hazardous Substances* (40 CFR Part 355). For purposes of this discussion, compounds included in the Clean Air Act Section 112(r) List of Substances for Accidental Release Prevention (40 CFR Part 68) are also considered hazardous materials. Materials identified on any of these lists that are expected to be used or produced by the proposed project are discussed herein.

A list of hazardous and extremely hazardous materials that are expected to be produced, used, stored, transported or disposed of as a result of exploration and production operations was assembled. Where possible, the quantities of these products or materials have been estimated on a per-well basis.

Some potentially hazardous materials that may be used in small, unquantifiable amounts have been excluded from this Management Plan. These materials may include:

- wastes, as defined by the Solid Waste Disposal Act;
- wood products, manufactured items and articles which do not release or otherwise result in exposure to a hazardous material under normal conditions of use (i.e., steel structures, automobiles, tires, etc.); and
- food, drugs, tobacco products and other miscellaneous substances (i.e., WD-40, gasket sealants, glues, etc.).

Project personnel will be directed to properly manage and dispose of hazardous materials. Solid wastes generated at well locations will be collected in approved waste facilities (e.g., dumpsters). Each well location will be provided with one or more such facilities during drilling and completion operations. Solid wastes will be regularly removed from well locations and transported to an approved disposal facility.

### **HAZARDOUS MATERIALS**

Materials produced, used, stored, transported or disposed of during the exploration and production phases of the project may be hazardous or may contain hazardous constituents. The following discussion will address the hazardous substances generally associated with the lifecycle of a coalbed methane well.

### **PRODUCTION STREAMS**

The purpose of the proposed project is to extract natural gas primarily from the Mesaverde Coal formation, with other deep formations targeted as well. Water, and perhaps, liquid hydrocarbons will be produced as a result of the extraction operations. Table C-1 lists and

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quantifies, where possible, the hazardous and extremely hazardous substances that may be found in the production streams.

### **Natural Gas**

Natural gas will be produced from approximately 1800 coalbed methane and, perhaps, conventional wells within the boundaries of the project at an average rate of 0.2 million cubic feet per day (mmcf/d) per well. The natural gas produced from the wells will primarily contain methane, ethane, nitrogen and carbon dioxide. Hexane, polynuclear aromatic hydrocarbons (PAHs) and polycyclic organic matter (POM) are hazardous substances that may potentially be present in the gas stream. No other hazardous substances are known to occur within the natural gas stream.

The natural gas produced from the project area wells will be transported from each location through newly constructed pipelines linking well locations to existing or newly constructed centralized production facilities. Natural gas storage facilities are not expected to be utilized.

### **Produced Water**

Produced water from wells within the project boundaries is expected to average 200 barrels per day (bpd) per well. Produced water quality from the wells within the project area is variable and will be monitored periodically. Water from the Mesaverde Coal and other targeted formations is known to contain the following hazardous substances:

Antimony	Copper	Selenium
Arsenic	Cyanide	Silver
Barium	Lead	Sodium
Beryllium	Mercury	Thallium
Cadmium	Nickel	Zinc
Chromium	Radium 226	

Phenol, an extremely hazardous substance, is also found in the produced water stream. No other hazardous or extremely hazardous materials are known to be present.

Produced water will be stored in tanks at centralized production facilities and disposed through Wyoming Department of Environmental Quality (WDEQ) or Wyoming Oil and Gas Conservation Commission (WOGCC) permitted water disposal systems. Produced water quality from wells will be monitored periodically and produced water that meets applicable standards may be discharged to the surface at appropriate locations. Agency authorizations that must be obtained prior to the disposal of produced water include:

- BLM approval of disposal methodologies;
- WDEQ Water Quality Division approval of wastewater disposal (e.g., National Pollution Discharge Elimination System permits and Underground Injection Control permits);
- WOGCC evaporation pond permits; and
- Wyoming State Engineer's Office (WSEO) dewatering permits.

### **Liquid Hydrocarbons**

Condensate or other liquid hydrocarbon production associated with the natural gas stream is not expected from productive coalbed methane wells in the project area. However, should

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any liquid hydrocarbon be produced, the stream would typically contain the following hazardous substances:

Benzene	POM
Ethylbenzene	Toluene
n-Hexane	Xylenes
PAHs	

No extremely hazardous materials are expected to be present in the liquid hydrocarbon stream.

Liquid hydrocarbons, if produced, will be stored in tanks at centralized production facilities. The tanks will be fenced and bermed to contain the entire storage capacity of the largest tank plus one foot of freeboard as mandated by the BLM. Liquid hydrocarbons, if produced, will be periodically removed from the storage tanks and transported via truck, in adherence to DOT rules and regulations, outside the project area. Necessary Regulatory approvals for the production, storage and transport of liquid hydrocarbons, including the Oil Pollution Act of 1990 (storage of >1,000,000 gal), will be addressed prior to the initiation of liquid hydrocarbon production activities.

### EXPLORATION AND PRODUCTION ACTIVITIES

Exploration and production activities associated with the project area will include geophysical, construction, drilling, testing, completion, production, maintenance, transportation, abandonment, and reclamation components.

Known hazardous and extremely hazardous materials typically utilized during exploration and production operations in the project area are listed in Table C-1 and generally fall into the following categories:

- fuels;
- lubricants;
- coolant/antifreeze and heat transfer agents;
- drilling fluids;
- fracturing fluids;
- cement and additives; and
- miscellaneous materials.

### Fuels

Gasoline, diesel, Jet A fuel, natural gas and propane are the fuels that may be employed within the boundaries of the project area. Each of the fuels contains materials classified as hazardous. Gasoline and diesel will be used by vehicles providing transport to and from the project area. Diesel, gasoline, and Jet A fuel will be used for geophysical survey operations. Diesel fuel will also be used in drilling operations and construction equipment, and as a minor component of fracturing fluids. Natural gas produced by the proposed project will be used to power compressor engines and other ancillary facilities. Propane will be utilized for miscellaneous heating purposes.

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### **Gasoline**

Gasoline will be used to power vehicles traveling to and from the project area. Gasoline will be purchased from regional vendors and primarily stored and transported in vehicle gas tanks. Some additional gasoline storage may be provided in appropriately designed and labeled one to five gallon containers for supplemental use as vehicle fuel. No large-scale storage of gasoline is anticipated. The hazardous substances expected to be present in gasoline include:

Benzene	n-Hexane	POM
Cumene	Methyl tert-butyl ether	Toluene
Cyclohexane	Naphthalene	Xylenes
Ethylbenzene	PAHs	

No extremely hazardous materials are expected to be present in the gasoline.

### **Diesel**

Diesel fuel will be used to power transport vehicles, geophysical vehicles, drilling rigs and construction equipment. Each well location will have aboveground storage tanks containing diesel fuel during drilling operations. Tanks will be filled by a local fuel supplier. The use, transport and storage of diesel fuel will be conducted in accordance with all relevant local, state and federal rules, regulations and guidelines. The hazardous substances expected to be present in diesel fuel include:

Benzene	POM
Ethylbenzene	Toluene
Naphthalene	Xylenes
PAHs	

No extremely hazardous materials are expected to be present in the diesel fuel.

### **Jet A Fuel**

Jet A fuel will be utilized to power geophysical vehicles. Jet A fuel will be purchased from regional vendors and primarily will be stored and transported in vehicle tanks. Some additional storage may be provided in appropriately designed and labeled containers for supplemental use as fuel. No large-scale storage of Jet A fuel is anticipated. The hazardous substances expected to be present in Jet A fuel include:

Benzene	n-Hexane	POM
Cumene	Methyl tert-butyl ether	Toluene
Cyclohexane	Naphthalene	Xylenes
Ethylbenzene	PAHs	

No extremely hazardous materials are expected to be present in the Jet A fuel.

### **Natural Gas**

Natural gas produced onsite will be burned to provide power for compressor engines and other ancillary facilities. Hazardous materials expected to be present in natural gas include n-

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Hexane, PAHs and POM. No extremely hazardous materials are known to exist in the natural gas from the project area.

### **Propane**

Propane will be utilized for miscellaneous heating purposes throughout the project area. The propane will be purchased from regional vendors and transported and stored in appropriate tanks. No large scale storage of propane is anticipated. The only hazardous material expected to be present in propane is propylene. No extremely hazardous materials are known to be present in propane.

### **Lubricants**

Various lubricants, including motor oils, hydraulic oils, transmission oils, compressor lube oils and greases, will be utilized in project equipment and machinery. Lubricants may contain hazardous substances, particularly:

Barium	Lead	PAHs
Cadmium	Manganese	POM
Copper	Nickel	Zinc

No extremely hazardous materials are known to be present in the lubricants required for the proposed project.

The lubricants will be used, stored, transported and disposed of following manufacturer's guidelines and local, state and federal requirements.

### **Coolant/Antifreeze and Heat Transfer Agents**

Various materials will be utilized as coolant/antifreeze and heat transfer agents in association with the project. Ethylene glycol, a hazardous substance, will be used as an engine coolant/antifreeze in vehicles, construction equipment, gas dehydrators and drilling and workover rigs. Additionally, ethylene glycol will be used as a heat transfer fluid during well completion and maintenance operations. No extremely hazardous materials are known to be present in the coolant/antifreeze and heat transfer agents required for the proposed project. Disposal of ethylene glycol will be conducted in accordance with applicable local, state and federal rules and regulations.

### **Drilling Fluids**

Water-based muds (drilling fluids) will be used for drilling each well. Drilling fluid additives consist of clays and other materials that are used in accordance with standard industry practices. Drilling fluid additives that are expected to be utilized in the drilling phase of coalbed methane well installation and their hazardous and extremely hazardous components are provided in Table C-1. Drilling operations will be conducted in compliance with applicable BLM, WOGCC and WDEQ rules and regulations.

Drilling fluid additives will be transported to well locations during drilling operations in appropriate sacks and other containers, in compliance with DOT regulations. Drilling fluids, cuttings and water will be stored in reserve pits. Netting (1 inch mesh) - to protect waterfowl, other birds and bats; pit liners - to protect shallow groundwater aquifers and conserve water;

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and perimeter fencing – to protect wildlife will be used as deemed appropriate by the BLM and WOGCC.

Following drilling and completion operations, the reserve pit contents will be evaporated or solidified in place, the pit backfilled and the surface reclaimed. Reserve pit solidification and/or closure procedures will be approved by the BLM, WOGCC and/or WDEQ prior to implementation. Alternatively, reserve pit contents may be removed and disposed of at an appropriate offsite facility in a manner commensurate with applicable local, state and federal regulations.

### **Fracturing Fluids**

Hydraulic fracturing is not expected to be performed on the coalbed methane wells within the project area. However, it is possible that a well will be hydraulically fractured periodically to augment gas flow rates. Fracturing fluids potentially containing hazardous substances that may be used within the project area are listed in Table C-1. No extremely hazardous materials are known to be present in the fracturing fluids required for the proposed project.

Fracturing fluids and additives will be transported to well locations in bulk or in appropriately designed and labeled containers. Transportation of fracturing fluids and additives will be in adherence with DOT rules and regulations.

During fracturing, fluids are pumped under pressure down the well bore and out through perforations in the casing into the formation. The pressurized fluid enters the formation and induces hydraulic fractures. When the pressure is released at the surface, a portion of the fracturing fluids will be forced back into the well bore, up to the surface and into a tank. The fracturing fluids will then be transferred to lined reserve pits and evaporated or transported offsite for reuse or disposal at an authorized facility. Decisions regarding the appropriate disposal of fracturing fluids would be made by the BLM, WOGCC and DEQ on a case-by-case basis.

### **Cement and Additives**

Well completion and abandonment operations include cementing and plugging various segments of the well bore to protect freshwater aquifers and other downhole resources. Materials potentially used for cementing operations include: cement, calcium hydroxide, calcium chloride, pozzolans, sodium bicarbonate, potassium chloride and insulating oil. An unknown quantity of cement and additives, which may contain the hazardous material classes of fine mineral fibers, PAHs and POM, will be transported in bulk to each well site. Small quantities may also be transported and stored onsite in 50 pound sacks. Wells will be cased and cemented as directed and approved by the BLM or WOGCC.

### **Miscellaneous Materials**

Miscellaneous materials will be used during geophysical, construction, drilling, testing, completion, production, maintenance, transportation, abandonment, and reclamation activities. Miscellaneous materials potentially containing hazardous substances that may be used within the project area are listed in Table C-1. Quantities of these miscellaneous materials are unknown. Materials will be transported to the site by service and supply companies and will be used, stored, transported and disposed of following manufacturer's guidelines and local, state and federal requirements.

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Industry standard pipeline materials, equipment, techniques and procedures, in conformance with all applicable regulatory requirements, will be employed during construction, testing, operation and maintenance activities to ensure pipeline safety and efficiency.

Small quantities of natural gas may be vented at certain well locations during testing operations. During testing, produced gas will be vented into a flare pit pursuant to the applicable BLM, WOGCC and WDEQ rules and regulations. BLM, WOGCC and WDEQ approval, as appropriate, will be obtained prior to venting operations.

### **COMBUSTION EMISSIONS**

Gasoline and diesel engines, flaring of natural gas and fired production equipment will produce combustion emissions within the project area. The complete oxidation of hydrocarbon fuels yields only carbon dioxide and water as combustion products. However, complete combustion is seldom achieved. Unburned hydrocarbons, particulate matter, carbon monoxide, nitrogen oxides, and possibly, sulfur oxides will be components of the exhaust streams. The formation of ozone from the photolysis of nitrogen oxides will also be expected. A listing of the hazardous and extremely hazardous materials potentially present in combustion emissions is provided in Table C-1.

Unburned hydrocarbons may contain potentially hazardous PAHs, while particulate matter may contain metal based particles from metallic lubricating oil additives and engine wear. Hazardous materials in the particulate matter may therefore include compounds of lead, cadmium, nickel, copper, manganese, barium and/or zinc. Particulate matter emissions and larger unburned hydrocarbons will eventually settle out on the ground surface, whereas gaseous emissions will react with other air constituents as components of the nitrogen, sulfur and carbon cycles.

Nitrogen dioxide, sulfur dioxide, sulfur trioxide and ozone are potential combustion emissions, all classified as extremely hazardous materials. Releases of these or other materials will not exceed allowable thresholds established by the Prevention of Significant Deterioration and WDEQ Air Quality regulations or the National Ambient Air Quality Standards.

### **MANAGEMENT POLICY AND PROCEDURE**

Project operators and their contractors will ensure production, use, storage, transport and disposal of hazardous and extremely hazardous materials associated with the proposed project will be accomplished in strict accordance with applicable existing, or hereafter promulgated, federal, state and local government rules, regulations and guidelines. Project related activities, involving the production, use and/or disposal of hazardous or extremely hazardous materials, will be conducted in such a manner so as to minimize potential environmental impacts.

Project operators will comply with emergency reporting requirements for releases of hazardous materials. Releases of hazardous or extremely hazardous substances in excess of the reportable quantity, as established in 40 CFR Part 117, will be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended. The materials for which such notification must be given are the extremely hazardous substances listed under the Emergency Planning and Community Right to Know Act, Section 302 and the hazardous substances designated under Section 102 of CERCLA, as amended. If a reportable quantity of a hazardous or extremely hazardous substance is

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released, prompt notice of the release will be given to the BLM's Authorized Officer and other appropriate local, state and federal agencies.

Additionally, notice of any spill or leakage (i.e. undesirable event), as defined in BLM NTL-3A, will be provided to the Authorized Officer and other such local, state and federal officials as required by law.

Project operators will prepare and implement, as necessary, the following plans and/or policies:

- spill prevention and control countermeasure plans;
- stormwater pollution prevention plans;
- liquid hydrocarbon spill response plans;
- inventories of hazardous chemical categories pursuant to Section 312 of the SARA, as amended; and
- emergency response plans.

Copies of the above will be maintained by the operators, as required by regulation, and will be made available upon request.

Exploration and production activities in the project area will comply with regulations promulgated under the Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation and Liability Act, Clean Water Act, Safe Drinking Water Act, Toxic Substances Control Act, Occupational Safety and Health Act, Clean Air Act, National Environmental Policy Act and Endangered Species Act, as appropriate. In addition, project activities will also comply with applicable state rules and regulations relating to hazardous material handling, storage, transportation, management, disposal, and reporting.



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**Table C-1. Hazardous and Extremely Hazardous Materials Potentially Utilized or Produced During Construction, Drilling, Production, and Reclamation Operations**

SOURCE	HAZARDOUS SUBSTANCES <sup>1</sup>	EXTREMELY HAZARDOUS SUBSTANCES <sup>2</sup>	CAS NO.	APPROXIMATE QUANTITIES USED OR PRODUCED PER WELL <sup>3</sup>
<b>Production Streams</b>				
Natural gas	n-Hexane PAHs <sup>4</sup> POM <sup>5</sup>		110-54-3 - -	0.2 mmcf
Produced Water	Antimony Arsenic Barium Beryllium Cadmium Chromium Copper Cyanide Lead Mercury Nickel  Radium 226 Selenium Silver Sodium Thallium Zinc	Phenols	7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9 7440-47-3 7440-50-8 - 7439-92-1 7439-97-6 7440-02-0 108-95-2 - 7782-49-2 7440-22-4 7440-23-5 7440-28-0 7440-66-6	200 bpd
Liquid Hydrocarbons	Benzene Ethylbenzene n-Hexane PAHs POM Toluene Xylenes		71-43-2 100-41-4 110-54-3 - - 108-88-3 1330-20-7	UNK
<b>Fuels</b>				
Gasoline	Benzene Cumene Cyclohexane Ethylbenzene n-Hexane Methyl tert-butyl ether Naphthalene PAHs POM Toluene Xylenes		71-43-2 98-82-8 110-82-7 100-41-4 110-54-3 1634-04-4 91-20-3 - - 108-88-3 1330-20-7	UNK

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**Table C-1. Continued.**

SOURCE	HAZARDOUS SUBSTANCES <sup>1</sup>	EXTREMELY HAZARDOUS SUBSTANCES <sup>2</sup>	CAS NO.	APPROXIMATE QUANTITIES USED OR PRODUCED PER WELL <sup>3</sup>
Diesel	Benzene		71-43-2	UNK
	Cumene		98-82-8	
Diesel – cont.	Ethylbenzene		10041-4	
	Naphthalene		91-20-3	
	PAHs		-	
	POM		-	
	Toluene		108-88-3	
	Xylenes		108-38-3	
Jet A Fuel	Benzene		71-43-2	UNK
	Cumene		98-82-8	
	Cyclohexane		110-82-7	
	Ethylbenzene		100-41-4	
	n-Hexane		110-54-3	
	Methyl tert-butyl ether		1634-04-4	
	Naphthalene		91-20-3	
	PAHs		-	
	POM		-	
	Toluene		108-88-3	
	Xylenes		108-38-3	
Natural Gas	n-Hexane		110-54-3	UNK
	PAHs		-	
	POM		-	
Propane	Propylene		115-07-1	UNK
Lubricants	Barium		7440-39-3	UNK
	Cadmium		7440133-9	
	Copper		7440-50-8	
	Lead		7439-92-1	
	Manganese		7439-96-5	
	Nickel		7440-02-0	
	PAHs		-	
	POM		-	
	Zinc		7440-66-6	
Coolant/Antifreeze and Heat Transfer Agents	Ethylene glycol		107-21-1	UNK
Drilling Fluids				
Barite	Barium compounds		-	16,000 lb
	Fine mineral fibers		-	
Bentonite	Fine mineral fibers		-	45,000 lb

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**Table C-1. Continued.**

SOURCE	HAZARDOUS SUBSTANCES <sup>1</sup>	EXTREMELY HAZARDOUS SUBSTANCES <sup>2</sup>	CAS NO.	APPROXIMATE QUANTITIES USED OR PRODUCED PER WELL <sup>3</sup>
Caustic soda	Sodium hydroxide		1310-73-2	750 lb
Glutaraldehyde	Isopropyl alcohol		67-63-0	20 gal
Lime	Fine mineral fibers		-	3,500 lb
Mica	Fine mineral fibers		-	600 lb
Modified tannin	Ferrous sulfate Fine mineral fibers		7720-78-7 -	250 lb
Phosphate esters	Methanol		67-56-1	100 gal
Polyacrylamides	PAHs POM	Acrylamide	79-06-1 - -	100 gal
Retarder	Fine mineral fibers		-	400 lb
<b>Fracturing Fluids</b>				
Biocides	Fine mineral fibers PAHs POM		- - -	UNK
Breakers	Copper compounds Ethylene glycol Fine mineral fibers Glycol ethers		- 107-21-1 - -	UNK
Clay stabilizer	Fine mineral fibers Glycol ethers Isopropyl alcohol Methanol PAHs POM		- - 67-63-0 67-56-1 - -	UNK
Crosslinkers	Ammonium chloride Methanol Potassium hydroxide Zirconium nitrate Zirconium sulfate		12125-02-9 67-56-1 1310-58-3 13746-89-9 14644-61-2	UNK
Foaming agent	Glycol ethers		-	UNK
Gelling agent	Benzene Ethylbenzene Methyl tert-butyl ether Napthalene PAHs POM Sodium hydroxide Toluene Xylenes		71-43-2 100-41-4 1634-04-4 91-20-3 - - 1310-73-2 108-88-3 1330-20-7	UNK

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**Table C-1. Continued.**

SOURCE	HAZARDOUS SUBSTANCES <sup>1</sup>	EXTREMELY HAZARDOUS SUBSTANCES <sup>2</sup>	CAS NO.	APPROXIMATE QUANTITIES USED OR PRODUCED PER WELL <sup>3</sup>
pH buffers	Acetic acid Benzoic acid Fumaric acid Hydrochloric acid Sodium hydroxide		64-19-7 65-85-0 110-17-8 7647-01-0 1310-73-2	UNK
Sands	Fine mineral fibers		-	UNK
Solvents	Glycol ethers		-	UNK
Surfactants	Glycol ethers Isopropyl alcohol Methanol PAHs POM		- 67-63-0 67-56-1 - -	UNK
<b>Cement and Additives</b>				
Anti-foamer	Glycol ethers		-	100 lb
Calcium chloride flake	Fine mineral fibers		-	2,500 lb
Cellophane flake	Fine mineral fibers		-	300 lb
Cements	Aluminum oxide Fine mineral fibers		1344-28-1 -	77,000 lb
Chemical wash	Ammonium hydroxide Glycol ethers		1336-21-6 -	850 gal
Diatomaceous earth	Fine mineral fibers		-	1,000 lb
Extenders	Aluminum oxide Fine mineral fibers		1344-28-1 -	17,500 lb
Fluid loss additive	Fine mineral fibers Naphthalene	Acrylamide	79-06-1 91-20-3	900 lb
Friction reducer	Fine mineral fibers Naphthalene PAHs POM		- 91-20-3 - -	160 lb
Mud flash	Fine mineral fibers		-	250 lb
Retarder	Fine mineral fibers		-	100 lb
Salt	Fine mineral fibers		-	2,570 lb
Silica flour	Fine mineral fibers		-	4,800 lb

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**Table C-1. Continued.**

SOURCE	HAZARDOUS SUBSTANCES <sup>1</sup>	EXTREMELY HAZARDOUS SUBSTANCES <sup>2</sup>	CAS NO.	APPROXIMATE QUANTITIES USED OR PRODUCED PER WELL <sup>3</sup>
<b>Miscellaneous Materials</b>				
Acids	Acetic anhydride		108-24-7	UNK
	Formic acid		64-18-6	
	Sodium chromate		777-11-3	
		Sulfuric acid	7664-93-9	
Batteries	Cadmium		744043-9	UNK
		Cadmium oxide	1306-19-0	
	Lead		7439-92-1	
	Nickel hydroxide		7440-02-0	
	Potassium hydroxide		1310-58-3	
		Sulfuric acid	7664-93-9	
Biocides		Formaldehyde	50-00-0	UNK
	Isopropyl alcohol		67-63-0	
	Methanol		67-56-1	
Cleaners	Hydrochloric acid		7647-01-0	UNK
Corrosion inhibitors	4,4' Methylene dianiline		101-77-9	UNK
	Acetic acid		64-19-7	
	Ammonium bisulfite		10192-30-0	
	Diethylamine		109-89-7	
	Dodecylbenzenesulfonic acid		27176-87-0	
	Ethylene glycol		107-21-1	
	Isobutyl alcohol		78-83-1	
	Isopropyl alcohol		67-63-0	
	Methanol		67-56-1	
	Naphthalene		91-20-3	
	Sodium nitrite		7632-00-0	
	Toluene		108-88-3	
	Xylenes		1330-20-7	
	Zinc carbonate		3486-35-9	
Emulsion breakers	Acetic acid		64-19-7	UNK
	Acetone		67-64-1	
	Ammonium chloride		12125-02-9	
	Benzoic acid		65-85-0	
	Isopropyl alcohol		67-63-0	
	Methanol		67-56-1	
	Naphthalene		91-20-3	
	Toluene		108-88-3	
	Xylenes		1330-20-7	
	Zinc chloride		7646-85-7	
Explosives, fuses, detonators, and boosters	Benzene		71-43-2	UNK
	Cumene		98-82-8	
	Ethylbenzene		100-41-4	
	Ethylene glycol		107-21-1	
	Lead compounds		7439-92-1	
	Methyl tert-butyl ether		1634-04-0	
	Naphthalene		91-20-3	
		Nitric acid	7697-37-2	
	Nitroglycerine		55-63-0	

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**Table C-1. Continued.**

SOURCE	HAZARDOUS SUBSTANCES <sup>1</sup>	EXTREMELY HAZARDOUS SUBSTANCES <sup>2</sup>	CAS NO.	APPROXIMATE QUANTITIES USED OR PRODUCED PER WELL <sup>3</sup>
	PAHs		-	
	POM		-	
	Toluene		108-88-3	
	Xylenes		1330-20-7	
Fertilizers	UNK		-	UNK
Herbicides	UNK		-	UNK
Lead-free thread compound	Copper		7440-50-8	25 gal
	Zinc		7440-66-6	
Methanol	Methanol		67-56-1	200 gal
Motor oil	Zinc compounds		-	220 gal
Paints	Barium		7440-39-3	UNK
	n-Butyl alcohol		71-36-3	
	Cobalt		7440-48-4	
	Lead		7439-92-1	
	Manganese		7439-96-5	
	PAHs		-	
	POM		-	
		Sulfuric acid	7664-93-9	
	Toluene		108-88-3	
	Triethylamine		121-44-8	
	Xylenes		1330-20-7	
Paraffin control		Carbon disulfide	75-15-0	UNK
	Ethylbenzene		100-41-4	
	Methanol		67-56-1	
	Toluene		108-88-3	
	Xylenes		1330-20-7	
Photoreceptors	Selenium		7782-49-2	UNK
Pipeline -				
Coating	Aluminum oxide		1334-28-1	UNK
Cupric sulfate solution	Cupric sulfate		7758-98-7	UNK
		Sulfuric acid	7664-93-9	
Diethanolamine	Diethanolamine		111-42-2	UNK
LP Gas	Benzene		71-43-2	UNK
	n-Hexane		110-54-3	
	Propylene		115-07-1	
Molecular sieves	Aluminum oxide		1344-28-1	UNK
Pipeline primer	Naphthalene		91-20-3	UNK
	Toluene		108-88-3	
Potassium	Potassium hydroxide		1310-58-3	UNK

## APPENDIX C: HAZARDOUS MATERIALS MANAGEMENT PLAN

**Table C-1. Continued.**

SOURCE	HAZARDOUS SUBSTANCES <sup>1</sup>	EXTREMELY HAZARDOUS SUBSTANCES <sup>2</sup>	CAS NO.	APPROXIMATE QUANTITIES USED OR PRODUCED PER WELL <sup>3</sup>
Rubber resin coatings	Acetone Ethyl acetate Methyl ethyl ketone Toluene Xylene		67-64-1 141-78-6 78-93-3 108-88-3 1330-20-7	UNK
Scale inhibitors	Acetic acid Ethylene diamine tetraacetic acid Ethylene glycol Formaldehyde Hydrochloric acid Isopropyl alcohol Methanol Nitrilotriacetic acid		64-19-7 60-00-4 107-21-1 50-00-0 7647-01-0 67-63-1 67-56-1 139-13-9	UNK
Sealants	1,1,1-trichloroethane n-Hexane PAHs POM		71-55-6 110-54-3 - -	UNK
Solvents	1,1,1-trichloroethane Acetone t-Butyl alcohol Carbon tetrachloride Isopropyl alcohol Methyl ethyl ketone Methanol PAHs POM Toluene Xylenes		71-55-6 67-64-1 75-65-0 56-23-5 67-63-0 108-10-1 67-56-1 - - 108-88-3 1330-20-7	UNK
Starting fluid	Ethyl ether		60-29-7	UNK
Surfactants	Isopropyl alcohol	Ethylene diamine	107-15-3 67-56-1	UNK
<b>Combustion Emissions</b>				
Combustion Products		Formaldehyde Nitrogen dioxide Ozone Sulfur dioxide Sulfur trioxide	50-00-0 10102-44-0 10028-15-6 7446-09-5 7446-11-9	XXXX XXXX XXXX XXXX XXXX
Unburned Hydrocarbons	Benzene Ethylbenzene n-Hexane PAHs Toluene Xylenes		71-43-2 100-41-4 100-54-3 - 108-88-3 1330-20-7	XXXX
Particulate matter	Barium Cadmium		7440-39-3 7440-43-9	XXXX

## APPENDIX C: HAZARDOUS MATERIALS MANAGEMENT PLAN

**Table C-1. Continued.**

SOURCE	HAZARDOUS SUBSTANCES <sup>1</sup>	EXTREMELY HAZARDOUS SUBSTANCES <sup>2</sup>	CAS NO.	APPROXIMATE QUANTITIES USED OR PRODUCED PER WELL <sup>3</sup>
	Copper		7440-50-8	
	Fine mineral fibers		-	
	Lead		7439-92-1	
	Manganese		7439-96-5	
	Nickel		7440-02-0	
	POM		-	
	Zinc		7440-66-6	

- 1 Hazardous Substances include those compounds identified in EPA's List of Hazardous Substances – 40 CFR Part 302 and List of Substances for Accidental Release Prevention – 40 CFR Part 68.
- 2 Extremely Hazardous Substances include those compounds identified in EPA's List of Extremely Hazardous Substances – 40 CFR Part 355.
- 3 lb = pounds, gal = gallons, mmcf/d = million cubic feet per day, bpd = barrels per day and UNK = unknown
- 4 PAHs – Polynuclear aromatic hydrocarbons
- 5 POM – Polycyclic organic matter